**Introduction**

Few studies have addressed implicit learning in preschool-aged children. Two studies from our laboratory have suggested reduced learning in 4-year-olds compared to older children and adults. However, the tasks used in these studies have had significant methodological differences. Traditionally, serial-reaction time (SRT) tasks have used response-contingent pacing in which the participant’s own reaction time determines the duration of each trial. In contrast, recent paradigms have used fixed trial pacing. This method can control for total stimulus exposure and task duration across participants, but is accompanied by changes in response demands and feedback motivation. In the current study, we directly compared learning on fixed-pace and self-paced versions of a spatial sequence learning paradigm in 4-year-olds and adults. We hypothesized that 4-year-old children would show reduced learning relative to adult participants, regardless of the paradigm used. In addition, we hypothesized that preschoolers would show greater learning when stimulus presentation was self-paced.

**Question**

Do preschool-aged children show increased learning on tasks with self-paced trials compared to fixed-paced trials?

**Participants**

All participants were initially screened for serious medical issues, learning disabilities, and personal or family history of neurological and/or psychological disorders.

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**Methods**

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**Task Instructions**: Tag the character as quickly as you can by pressing the button that corresponds to his spatial location.

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**Sequence Structure**: Identical 10-step partially ambiguous sequence with interleaved random and sequence trials

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**Stimuli**

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**Fixed-Paced Task**

- Fixed trial duration (children = 1500 ms, adults = 1000 ms); ITI = 1500 ms
- No accuracy feedback

**Self-Paced Task**

- Variable trial duration; ITI = 500 ms
- Pace contingent upon time taken for correct response on previous trial

**Learning Measure**

- Time

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**Learning Results**

• Adults and preschoolers showed statistically significant learning on all tasks (p < .01)

• Magnitude of adult learning did not differ by task

• Preschoolers learned significantly more on the self-pace condition vs. the fixed-paced condition (p < .01)

**Learning Across Block Results**

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**Conclusion**

Summary: Preschool-aged children learned significantly more on a self-paced version than on a fixed-paced version of the serial reaction time (SRT) task, indicating that tasks demands strongly influence implicit learning in this age group.

Remaining Questions: What are the critical differences between these two tasks that result in greater learning for preschool-aged children?

• pace or timing

• accuracy feedback

• motivation

Future Directions:

• Follow-up study using a self-paced task without accuracy feedback to better assess role of feedback vs. pacing in learning

• Testing older children to determine when performance on fixed- and self-paced tasks becomes equivalent

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